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ABSTRACT

A study of 398 young adults (ages 21-26) with severe disabilities who had been out of school for 1.75 to 5 years was conducted to validate a four-factor model of quality of life for youth with severe disabilities in transition from school to community and from youth to adulthood. Information was gathered on life satisfaction, employment-economic integration, employment stability, personal choice/control, residential integration, social networks, community assimilation and acceptance, social/recreational-leisure integration, family integration, formal support services, citizenship/contribution, and educational involvement. Results of the study found that the four-factor model of quality of life reflects and corresponds to those defining dimensions proposed by the related quality-of-life literature. The first dimension is "adult performance/independence," defined by personal control in adult life, citizenship, residential integration, and educational attainment. The second dimension is "interpersonal relationship/community and family integration," which is characterized by family integration, social network, and community assimilation and acceptance. The third dimension of "productivity (economic stability)" is defined by an individual's involvement in stable and integrated daily work or related activities, occupational or employment characteristics, income, and degree of self-sufficiency. The last dimension is "psychological well-being (satisfaction)," which is determined by personal overall satisfaction and involvement in recreation-leisure activities. (Contains 64 references.) (CR)

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Factor Analysis of Quality of Life for Individuals with Severe Disabilities in Transition

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Abstract

This research investigated the reliable dimensions and a factorial model of quality of life for individuals with severe disabilities in transition from youth to adulthood, in order to develop a framework that might practically benefit policy-making, educational intervention, and theoretical research. Survey data from the National Transition Study of Individuals with Severe Disabilities (NTSSD) concerning the life experiences and status of 398 young adults with disabilities who had been out of school for 1.75 to 5.0 years were analyzed. The exploratory and confirmatory factor analyses empirically validated a four-factor model of quality of life for individuals with severe disabilities through a three-phase process of model development, respecification, and significance test. A modified version of the original hypothetical model was statistically supported. The findings and results of this study differ from those of other quality-of-life-related post-school outcome studies conducted over the past two decades, particularly by establishing an empirically supported pattern of quality of life constructs. Recommendations are offered concerning the implications of these findings for future research, school practice, and transition services.

Factor Analysis of Quality of Life

for Individuals with Severe Disabilities in Transition

Concern over the transition from youth to adulthood for individuals with disabilities has gained increasing attention in the past two decades. This concern has resulted in a strong agreement on the benefits of assisting young people with disabilities and their families during the critical transition years. However, as complex as this transition period would seem to be, the development of the conceptualization of transition has become more complicated than the early attempt initiated by the U.S. Office of Special Education and Rehabilitative Services (OSERS). Presently, a different concept of "quality of life" has emerged in an attempt to express this multidimensional and broadened connotation of transition (e.g., Karan, Lambour, Greenspan, 1990; Halpern, 1993).

This effort to take a broader perspective on transition outcomes is consistent with other research concerning people with disabilities that attempts to capture such encompassing concepts as quality of life (e.g., Borthwick-Duffy, 1990; 1992; Edgerton, 1975; 1990; Goode, 1990; 1994; Inge, Banks, Wheman, Hill, & Shafer, 1988; Landesman, 1986; Park, Tappe, Cameto, & Gaylord-Ross, 1990; Parmenter, 1988; 1992; Schalock, 1989; 1990), community adjustment (e.g., Halpern, Nave, Close, & Nelson, 1986; McGrew & Bruininks, 1991; Bruininks, Thurlow, McGrew, & Lewis, 1990; Seltzer, 1981) and independence (e.g., Harnish, Chaplin, Fisher, & Tu, 1986; Wagner, D'Amico, Marder, Newman, & Blackorby, 1992). Currently, in order to respond to the broader mandate of Public Law 101-476 of 1990 in an more effective manner, several researchers (e.g., Halpern, 1993) have attempted to apply the

concept of quality of life to signify the progressive, multi-magnitude, and broadened notion of transition for individuals with disabilities, even though it is not used explicitly in the legislation.

It is believed that the effectiveness of services for individuals with disabilities should be measured by the degree to which quality of life has been enhanced (Bellamy, Newton, LeBaron & Horner, 1990; Goode, 1990; 1994; Sands, Kozleski, & Goodwin, 1992; Sands & Kozleski, 1994), and quality-of-life indicators are viewed as a more accurate standard for establishing social validity in measuring adult-life outcomes (Hawkins, 1991). Researchers (e.g., Dennis, Williams, Giangreco, & Cloninger, 1993; Halpern, 1993; Schalock, Keith, Hoffman, & Karan, 1989) further argue that quality of life could serve as a conceptual framework for evaluating transition outcomes or general well-being. It seems that by using quality-of-life indicators researchers could have an more holistic alternative to delineate the profile of transition outcomes for individuals with disabilities, have a more inclusive picture of transition outcomes for individuals with disabilities, check social policies that serve to increase quality of life for people with disabilities, and verify and articulate the transition conceptual frameworks proposed by others.

However, the literature on quality of life that has emerged during the past few years within the field of disability shows that the issues are much broader and more complex than is reflected in simply questioning the adequacy of employment as an indicator. Investigators of quality of life in transition frequently focus on single outcomes in areas such as employment, education, living arrangement, social support through various human services, and community adjustment (e.g., Bruininks, Lewis,

& Thurlow, 1988; Heal, 1985; Heal & Chadsey-Rusch; 1985; Wehman, Kregel, & Barcus, 1985), with career and employment being reported most often (Borthwick-Duffy, 1992; Halpern, 1993; McGrew, Bruininks, Thurlow, & Lewis, 1992). Even though single outcome measures of quality of life have produced valuable descriptive information, they usually fail to capture the complexity of quality of life that is needed to develop and evaluate comprehensive models.

In addition, there is no single definition of the term, but most of the researchers have agreed that the concept of quality and the assessment of life quality is essentially subjective (e.g. Blatt, 1987; Edgerton, 1990; Halpern, 1993; Schalock, 1990; Taylor & Racino, 1991). For example, Blatt (1987) emphasized the temporal, relative, and individual nature of the definition of quality of life. Dennis, Williams, Giangreco, and Cloninger (1993) assert that: (1) no single definition of quality of life exists; (2) there is potential bias in defining quality of life even for researchers; (3) quality of life of individuals is closely related to that of those around them; and (4) the attributes of quality of life are temporal, or fluid, and are affected by context.

As Taylor and Racino (1991) noted, philosophers and researchers throughout the ages have failed to agree on the meaning of quality of life. They cautioned that such a complex issue is no easier to describe for people with disabilities than it has been for others. For example, many researchers have concurred that quality of life for people with disabilities comprises the same factors as quality of life for people without disabilities (Blatt, 1987; Devereux, 1988; Goode, 1990; Schalock, 1990b; Turnbull & Brunk, 1990; Weick, 1988). However, in a most recent study, Sands and Kozleski (1994) have also found differences in marital status and opportunities to

make choices, as well as in the extent of social networks and activities experienced by these two groups. The authors mention that quality of life is a socially constructed phenomenon that must be addressed by increasing opportunities for self-determination in terms of both skill development and environmental supports.

Due to the definitional issue of quality of life, researchers (e.g., Goode, 1990) have suggested the use of principles instead of definitions for considering quality of life as related to individuals with disabilities in hoping to get a clear picture of quality of life. One example of the quality-of-life principles is that the quality of life is like the basic needs (e.g., food, clothing, housing, safety) that should be entitled to all human beings (at least every citizen).

Based on the review of the literature of quality of life, it is found that the primary domains within the quality of life in transition seem not easily to be empirically identified. Even though the quality of life research in mental retardation has been conducted for several decades, so far the parameters of the quality of life have not been clearly specified. The literature does, however, suggest there are a variety of factors central to the quality-of-life construct. In addition, it is interesting to find that the lists of the components of quality of life are never the same for each researcher. The initiation of quality-of-life constructs by different investigators, from different perspectives, different approaches, different time, and in different settings could all affect the content of its list. For example, as mentioned by Mukherjee (1989), from the elite perspective, where the researchers use the Delphi approach and collect data from experts only, the primary components for a better quality of life of a better world society usually included food, materials, energy, environment, technology, and

population. On the other hand, from the mass perspective, where the researchers focus on what do people want and collect data from ordinary people directly, the list of quality-of-life elements would consist of spiritual gain, social status, well being, economic status, security, and survival. Obviously, the issue raised here is not to choose or compare among the lists or models, but to identify the basic outcome domains represented in the concept of quality of life that are more frequently adopted by researchers and primarily appropriate to people with and without disabilities.

Accordingly, the primary purpose in this investigation was to facilitate further conceptual and empirical efforts that may contribute to the development of more comprehensive quality-of-life models for youth with severe disabilities in transition from school to community and from youth to adulthood by factor analyses. It was specifically designed to expand and extend a line of research that has attempted to improve the quality of life for individuals with disabilities. This study included additional variables in the construction of the several of the multivariate quality-of-life indicators that were used in prior studied to provide richer, more comprehensive, and more complete measures. The potential importance and relevance of gathering information on a broad array of quality-of-life dimensions (e.g., psychological satisfaction, personal choice, employment, community involvement, recreation/leisure, citizenship, educational involvement, family integration, social network) was emphasized, in hopes of making manifest the complex and multidimensional nature of quality of life of individuals with severe disabilities. This better understanding of the many factors that contribute to quality of life in transition will increase the possibilities of designing more effective public policies, high school programs, adult

and community services, and family support systems for these youth and their families. Additionally, this study investigated the latent constructs underlying the quality-of-life concept through exploratory and confirmatory factor analyses from a larger and more representative sample of youth with severe disabilities than were represented in prior investigations.

Method

Subjects

The sample for this study was comprised of 398 youth with severe disabilities who had been out of high school from one to four years in 1993. As shown in Table 1, there were slightly more males (53%) than females (47%) in the sample. Most of the youth (95.7%) were never married. The greatest number of the youth with severe disabilities lived in urban settings (40.7%), while 35.2% lived in suburban area and 24.1% in rural area. Approximately 84% of the sample successfully obtained a formal school completion credit (e.g., diploma or certificate). While 56.7% of the sample graduated with a diploma, 27% graduated with a certificate. With regards to the diagnostic characteristics, the majority of youth with severe disabilities in the sample had a primary diagnosis of mental retardation (61.3%). Most of the youth with severe disabilities in the sample were classified as having a severe disability not because of severe mental retardation. The largest portion of the subjects in the sample was classified as being within either the mild (28.2%) or moderate (27.0%) levels of mental retardation, followed by approximately 16% in the severe level and 9.6% in the profound level of mental retardation.

Table 1

Characteristics of the Sample

Characteristic	n	%
Gender (N=398)		
Female	187	47.0
Male	211	53.0
Marital Status (N=398)		
Never married	381	95.7
Married	14	3.5
Separated	2	0.5
Divorced	1	0.3
Widow or widower	0	0.0
Urbanicity (N=398)		
Rural	96	24.1
Suburban	140	35.2
Urban	162	40.7
Level of Mental Retardation (N=397)		
None	59	14.9
Mild (IQ 52-70)	112	28.2
Moderate (IQ 36-51)	107	27.0
Severe (IQ 20-35)	63	15.9
Profound (IQ under 20)	38	9.6
Unknown	18	4.5
Legal Status (N=398)		
Legally competent adult	173	43.5
Parent or relation is guardian or conservator	197	49.5
Non-relative is guardian or conservator	7	1.8
State or county is guardian or conservator	16	4.0
Other	5	1.3
Exit Status (N=397)		
Graduated with diploma	225	56.7
Graduated with certificate	107	27.0
Dropped out	14	3.5
Aged out	51	12.8

In this study, the definition of severe disabilities was based on several other factors (e.g., functional limitations, presence of other disabilities), rather than mainly on the level of mental retardation. The mean age of the sample was 23.6 years (range 21 to 26) and the mean time out of school was 3.4 years months (range 1.8 to 5.0). In

terms of adaptive behavior based on the Inventory for client and Agency Planning (ICAP) (Bruininks, Hill, Weatherman, & Woodcock, 1986), the subjects in the sample had broad adaptive behavior capabilities equivalent to 6- to 8-year-old individuals without disabilities.

Instrumentation

There were two survey instruments used in the current study. The first survey instrument is the National Outcome survey on the Transition of Individuals with Severe Disabilities (Johnson, Bloomberg, McGrew, Price, & Lin, 1992, which was drawn from a pool of data collection tools which have evolved over many years of systematic transition and community adjustment/integration research at the University of Minnesota (Bruininks, Chen, Lakin, & McGrew, 1992; Bruininks, Lewis, & Thurlow, 1988; Bruininks, Thurlow, McGrew, & Lewis, 1990; Johnson, Thompson, Sinclair, & Bruininks, 1992; Johnson, 1993; McGrew & Bruininks, 1994; McGrew et al., 1992; McGrew et al., 1994). The second survey instrument is the Inventory for client and Agency Planning (ICAP) (Bruininks, Hill, Weatherman, & Woodcock, 1986).

The National Outcome survey on the Transition of Individuals with Severe Disabilities was developed to contain empirically derived indicators of multidimensional outcomes, and has been revised to measure the major postschool/quality-of-life outcome domains identified by researchers at the University of Minnesota as well as to include new domains (e.g., personal choice and family needs and support). This survey instrument consisted of 100 questions across eleven sections: (1) general information (i.e., demographic information); (2) employment and

daytime activities (e.g., employment history and characteristics, satisfaction); (3) high school experiences (e.g. high school employment experiences, extracurricular activities, satisfaction); (4) living arrangements (e.g., where and with whom the youth lives, and satisfaction); (5) family and friends (e.g., social network, friendships, leisure activities, satisfaction); (6) community involvement (e.g., participation in individual and group activities, transportation, satisfaction); (7) financial independence (e.g., independence in shopping and banking); (8) personal choice (e.g., degree of self-determination in making decisions about housing, employment, and leisure activities); (9) family needs and support (e.g., extent to which families receive necessary financial, social, and emotional support); (10) social skills scale (e.g., degree of social competence exhibited across a variety of social situations); (11) waiting for services (availability, access, and use of community services).

The ICAP was administrated in order to adequately measure personal characteristics of the sample, and to facilitate the analysis of data according to important subject characteristics (e.g., male vs. female; urban vs. rural). The ICAP is a tool for managing information in areas related to planning and evaluating services for individuals with disabilities, including information on the subject's diagnostic and health status, adaptive behavior, problem behaviors, projected service needs, current service placement, support services, and social-leisure activities. Detailed subject Descriptive Information was collected via the ICAP in the areas of gender, race, primary language, primary means of expression, marital status, legal status, and diagnostic status. Information under the area of Functional Limitations and Needed Assistance included level of retardation, status of vision and hearing, frequency of

seizures, health limitations, required care by nurse or physician, current medications, arm/hand use, mobility limitations, and need for mobility assistance. The Adaptive Behavior section of the ICAP contained 77 adaptive behavior items in the broad areas of Motor, Social/Communication, Personal Living, and Community Living. Eight Problem Behavior Scales provided information regarding three broad areas of problem or maladaptive behavior (Internalized, Externalized, Asocial).

The application of the ICAP to gather important subject characteristic information enhanced the ability of the current study to build upon a systematic research which focused on (a) identifying the major dimensions of personal competence or adaptive behavior for individuals with disabilities, (b) investigating models of personal competence or adaptive behavior, and (c) investigating the relationship between dimensions of personal competence or adaptive behavior and quality of life in transition. The use of the ICAP also allowed the results of the current study to be interpreted within a conceptual model of personal competence or adaptive behavior.

Procedure and Data Analysis

The processes of the organization and specification of composite variables involved the construction of indicator variables and the screening of variables for inclusion in the analysis. About four hundred fifty-three (453) survey items (including 245 items of the National Outcome Study on the Transition of Individuals with Severe Disabilities survey instrument and 208 items of the ICAP survey instrument) were used to create eighty-three (83) indicator variables, forty (40) of which were used in

the quality-of-life factor analysis. The dimensions of quality of life used in the current study were shown in Figure 1.

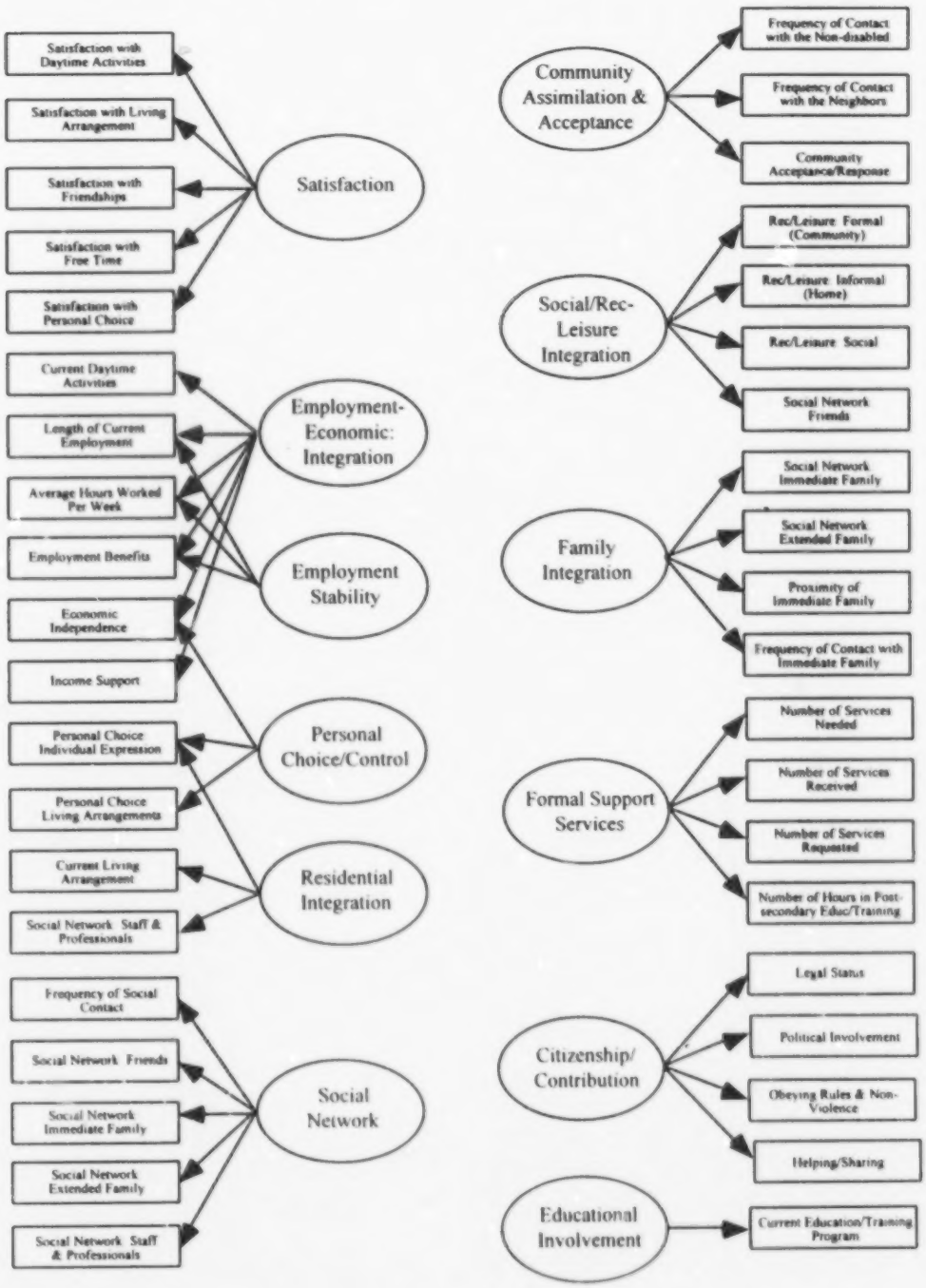

Figure 1. Dimensions of Quality of Life Used in the Current Study

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The exploratory factor analysis was completed by using the SPSSPC computer program (PC/DOS-based Version 5.0; SPSS Inc., 1992). The LISREL-based confirmatory factor analysis was completed using the LISREL computer program (PC/DOS-based Version 8.02; Jöreskog and Sörbom, 1993b). The goal of the factor extraction step is to determine the factors of the quality of life construct. A principle-components analysis followed by varimax rotation was used to complete the exploratory factor analysis of quality-of-life construct development with sample data (n=398) in the first step of the data analysis process.

To help the researcher decide how many factors are needed to represent the data, a combination of the objective (i.e., eigenvalues greater than one [Kaiser, 1960]; scree test [Cattell, 1966]) factor extraction and subjective (i.e., relationship to the quality-of-life theories, interpretability of the identified factors [Thompson, 1994]) criteria were employed. The procedures of analysis that were used to identify the factor model of quality of life were shown in Table 2.

Table 2

Phases and Methods of Data Analysis

Phases of Analysis	Method of Analysis
Phase 1 Development of exploratory model	Exploratory Factor Analysis using Principle Components Method
Phase 2 Testing of the exploratory models	Confirmatory Factor Analysis using Unweighted Least Squares Method
Phase 3 Testing best fitting Models from Phases 2	Confirmatory Factor Analysis using Unweighted Least Squares Method

Note: The reason for employing the unweighted least squares method is due to the characteristics of the data in this study (see Wothke, 1993) .

Results

Results of the Exploratory Factor Analysis

The results in the current study support that there exist relatively smaller number of latent constructs of quality of life through the use of exploratory factor analysis. The exploratory factor analysis identified four eigenvalues that were greater than one (1.0). The four-factor varimax rotated solution was determined to be the most interpretable solution. The scree test also suggested the presence of four factors. The varimax-rotated solution, plus the descriptive statistics for all variables, is presented in Table 3. Table 3 shows the rotated and sorted factor pattern matrix that quality-of-life indicator variables with high loadings on the same factor appear together, and no loadings less than 0.5 in absolute are displayed.

Factor 1 (Adult Performance/Independence) was defined by variables that measured the extent to which an individual is involved in adult performance related activities, or is independent of completing adult performances. The four highest loading variables were personal control/choice (0.85), citizenship/contribution (0.74), residential integration (0.72.), and educational attainment (-0.66). The negative factor loading for educational attainment suggests that youth with severe disabilities with the least educational attainment were among those who were the highest functioning on all other adult-performance variables. This may be because that to have educational attainment will tend to limit one's involvement in residential integration, citizenship, and personal choice.

Factor 2 (Productivity/Economic Stability) represents the extent to which an individual is involved in stable and integrated daily work or related activities. The

factor was defined exclusively by the two employment related variables (employment-economic integration [0.93], and employment stability [0.93]).

Table 3

Varimax Rotated Factor Matrix of the Eleven Quality-of-Life Indicator Variables

	Adult Performance	Productivity	Interpersonal Relationship	Psychological Well-being
PCHOICE	.85			
CITIZEN	.74			
RESIDENT	.72			
EDUCATI	.66			
EMPECON		.93		
EMPSTBL		.93		
SOCIAL			.89	
FAMILY			.89	
SATISFA				.69
RECLEI				.66
ASMACCEP				.61

Note. EMPECON represents the composite variable of Employment-Economic Integration. EMPSTBL represents the variable of Employment Stability. RESIDENT represents the variable of Residential Integration. FAMILY represents the variable of Family Integration. SOCIAL represents the Social Network variable. ASMACCEP represents the variable of Community Assimilation & Acceptance. CITIZEN represents the variable of Citizenship/Contribution. RECLEI represents the variable of Rec-Leisure Integration. PCHOICE represents the variable of Personal Choice/Control. SATISFA represents the variable of Satisfaction. EDUCATI represents the variable of Educational Involvement.

Factor 3 (Interpersonal Relationship or Community/Family Integration) appeared to define a dimension that represents a person's degree of active involvement in interpersonal relationship in terms of family, social, and community interactions.

The two highest positive loading variables were social network (0.89) and family integration (0.89).

Factor 4 (Psychological Well-being/Satisfaction) was defined by satisfaction, recreation-leisure integration, and community acceptance. This factor suggests that youth with severe disabilities who are more involved in recreation-leisure activities also report higher satisfaction and accepted more by the community.

Results of the Confirmatory Factor Analysis

After the exploratory model being developed, a number of confirmatory factor analyses with different estimation method in the LISREL computer program (Jöreskog & Sörbom, 1993b) were completed to test the model built. Multiple fit statistics were also employed to evaluate the confirmatory models, due to no consensus regarding which goodness-of-fit statistics to use from the large number that are available (Tanaka, 1993). Chi-square statistics, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), the standardized root means square residual (RMR), and the root mean square error of approximation (RMSEA) (see Hayduk, 1987; Jöreskog and Sörbom, 1993a; Loehlin, 1987) are reported for the quality-of-life factor model presented in this study.

The chi-square value is a measure of overall fit of the model to the data and provides a useful index of the fit of models (Loehlin, 1987). In a statistical sense, the chi-square statistic is a badness-of-fit measure in that a small chi-square indicates good fit and a large chi-square corresponds to bad fit (Jöreskog & Sörbom, 1993a). However, chi-square tends to be large in large samples, since chi-square is dependent on the sample size (Jöreskog & Sörbom, 1993a). In order to eliminate and reduce the

dependence on sample size in the current study, a number of other goodness-of-fit measures (i.e., GFI, AGFI, RMR, RMSEA) have been proposed (Jöreskog & Sörbom, 1993b). The goodness-of-fit measures (i.e., GFI, AGFI, RMR, RMSEA) do not explicitly depend on sample size and measure how much better the model fits as compared to no model at all. Unlike the chi-square, the larger the GFI and AGFI statistics indicate better fitting models (Tanaka, 1993). GFI and AGFI statistics ranging between zero and one, are similar to the multiple and adjusted multiple correlation in regression analyses with the value of 1.0 representing a perfect fit (Tanaka, 1993). GFIs above 0.90 and AGFIs above 0.80 are indicative of a good fitting model (Cole, 1987). On the other hand, the RMR below .10 reflects a good fit between a model and data (Cole, 1987). A value of 0.05 of RMSEA indicates a close fit and that values up to 0.08 represent reasonable errors of approximation in the population (Browne & Cudek, 1993). For assessing the degree of approximation in the population, a 90 percent confidence interval of RMSEA and a test of RMSEA < 0.05 give quite useful information.

The result of the final version of the confirmatory four-factors quality-of-life analysis shows that a modified model is accepted according to the guidelines of Browne and Cudeck (1993)(see Table 4). Here the point estimate of RMSEA is 0.04 which is below 0.05 and the ninety (90) percent confidence interval is from 0.02 to 0.06. The P-value for test of close fit is 0.74, which accept the four-factor modified model. Other indications the model fit well are that the RMR of 0.05, GFI of 0.99, AGFI of 0.97. Therefore, the researcher concludes that the re-specified model fits well and represents a reasonably close approximation in the population.

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Table 4

Summary of Fit Statistics for Confirmatory Factor Analyses

Model	Chi-square/df	RMR	GFI	AGFI	RMSEA
The First Modified Model	128.46/38	.07	.97	.94	.08
The Final Modified Model	61.87/36	.05	.99	.97	.04*

Note. * represents the significant acceptance of the model.

This final model differed from the first specified exploratory model in several areas. First, the final modified model has the better fit statistics for the confirmatory factor. Second, there are six no-zero latent factor correlations (see Figure 2). The positive direction of the six latent factor correlations indicates that as youth with severe disabilities in the sample showed higher functioning and more positive quality of life on the measures on a factor, they showed a similar trend on the correlated factors. Among these factors, the Adult Performance and Interpersonal Relationship factors were high correlated with the factor of Psychological Well-being, with correlation of 0.61 and 0.64 respectively. These indicate that the youth with severe disabilities who are more involved in adult performance and interpersonal relationships are those who are more involved in rec-leisure activities and are more satisfied with their current status.

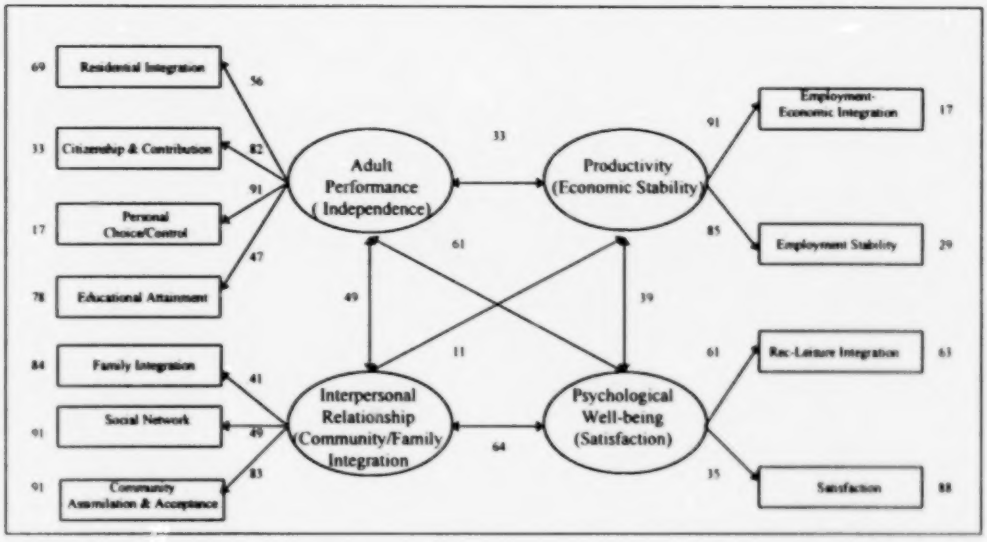

Figure 2. The four-factor quality-of-life model

The key finding is that the four-factor model of quality of life reflects and corresponds to those proposed by the related quality-of-life literature. The first dimension is "Adult Performance/Independence", defined by an individual's involvement in personal control in adult life, citizenship, residential integration, and educational attainment. While this dimension is the best predictor of the quality of life construct, the personal control/choice is the most valid indicator of this factor. The second dimension is "Interpersonal Relationship/Community and Family Integration" which characterized by family integration, social network, and community assimilation and acceptance. The community assimilation and acceptance is the best indicator of this factor. The third dimension of "Productivity (Economic Stability)" is defined by an individual's involvement in stable and integrated daily work or related activities, occupational or employment characteristics, income, and degree of self-

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sufficiency. The best indicator of this factor is employment-economic integration composite variable. The last dimension is "Psychological Well-being (Satisfaction)" which is determined by personal overall satisfaction and involvement of recreation-leisure activities. The recreation-leisure composite variable is the most valid indicator of this factor.

Discussion

The exploratory factor analysis with varimax rotated solution identified four factors of the quality-of-life construct. The number (i.e., four) of dimensions of quality of life identified by this current investigation is the same to that of Gossett (1989), Schalock (1991) and Halpern et al. (1986) research, but is different from that (i.e., three) reported by Parmenter (1988) and Halpern (1993). The multidimensional-factor model of quality of life that is generated through exploratory factor analysis will have a latent factor structure that is the same as that created by confirmatory factor analysis was, however, not supported by the subjective criteria applied in the current study. Based on the subjective criteria of relationship to the quality-of-life theories and interpretability of the identified factors, it seems that a four-factor model is reasonable, except for the indicator of Community Acceptance involved in the factor of Psychological Well-being/Satisfaction. It seems that this specific composite variable should better be moved to the factor of Interpersonal Relationship or Community/Family Integration which looked to define a dimension that represents a person's degree of active involvement in interpersonal relationship in terms of family, social, and community interactions. This modification had been seen in many factor

analytic research studies (e.g., McGrew, Johnson, & Bruininks, 1994; Thompson, 1995)

The final four-dimensional quality-of-life model of best fit that is generated by confirmatory analysis will be better supported by the data in terms of goodness-of-fit was validated by the current study. This multidimensional model of quality-of-life construct consisted four valid factors: Adult Performance/Independence, Interpersonal Relationship/Community and Family Integration, Productivity (Economic Stability), and Psychological Well-being (Satisfaction).

The first dimension validated in the current investigation is "Adult Performance/Independence" defined by an individual's involvement in personal control in adult life, citizenship, residential integration, and educational attainment. This factor is conceptually similar to the Performance of Adult Roles factor reported by Halpern (1993), and similar to Schalock (1991) Independence factor. The Adult Performance factor differs from Halpern's Performance of Adult Roles by extracting the vocation, career, employment, leisure and recreation, and mobility and community access mentioned in Halpern's model into other separate constructs. The personal control/choice is the most valid indicator of this factor.

The second dimension of "Interpersonal Relationship/Community and Family Integration" found in this study is similar to Bruininks et al.'s (1992) Family Contact/Relationships factor, Halpern et al.'s (1986) Social Support/Safety factor, McGrew et al.'s (1992) Social Network/Integration factor, McGrew et al.'s (1994) Social Network/Integration, and Thompson's (1995) Social Network Integration factor. All of these factors indicate aspects of social network and social support system of

individuals with disabilities. The only difference is that the Interpersonal Relationship in the current study included the community acceptance variable; while some other studies identified the community acceptance as a separate factor (e.g., Bruininks et al., 1992; Thompson, 1995). The "Community Assimilation and Acceptance" dimension was defined by McGrew and Bruininks as "a reflection of both involvement with and degree of positive response or acceptance of a person with a disability by neighbors and others in the community" (p. 74). As Bruininks et al. (1992) pointed out, this factor is similar to the "Social Support and Safety" factor reported by Halpern and his colleagues (Halpern et al. 1986). In this factor, community assimilation and acceptance is the best indicator.

The current investigation also provides support for the dimension of "Productivity (Economic Stability)" defined by an individual's involvement in stable and integrated daily work or related activities, occupational or employment characteristics, income, and degree of self-sufficiency. This factor is similar to Halpern et al.'s (1986) Occupation factor, McGrew et al.'s (1992) Community/Economic Integration Factor, McGrew et al.'s (1994) Employment-Economic Integration and Employment Stability factors, and Thompson's (1995) Employment-Economic Integration factor. The Productivity factor differs from McGrew et al.'s (1994) Employment-Economic Integration and Employment Stability factors by merging these two factors into one integrated construct so that it helped to eliminate interpretation redundancy and likeness. The best indicator of this factor is the employment-economic integration composite variable.

The "Psychological Well-being (Satisfaction)" factor supported in this study, defined by personal overall satisfaction and involvement of recreation-leisure activities, is similar to Halpern et al.'s (1986) Client Satisfaction factor. Halpern et al. (1986) defined "Personal Satisfaction" by the extent to which individuals appear satisfied with their daytime activities, living arrangements, social network, and recreation/leisure activities. In fact, psychological well-being (e.g., personal satisfaction) has emerged in every study where satisfaction indicators were included. This dimension is unique in that it is the only factor that reflects subjective feelings and judgment. In discussing the "Quality of Life" construct, Schalock (1990a) defines psychological indicators as a person's subjective reactions to life experiences. Based on Schalock explanation, "Satisfaction" is the only psychological dimension included in the current study of quality-of-life factor model. The recreation-leisure composite variable is the most valid indicator of this factor.

Several factors reported in other studies that were not present in the current investigation were factors that define the extent to which an individual needs a variety of services and support to function within the community (need for support services) (e.g., McGrew et al., 1992; 1995; Thompson, 1995), and the mobility and community access (e.g., Halpern, 1993). These factors were not present in the current investigation primarily because certain variables did not appropriately indicate quality-of-life outcomes and there were no appropriate indicators to define these factors.

In addition, there are six non-zero latent factor correlations among these four factors. The data suggest that success in any of these domains tends to provide

indication of likely success in another. This result is totally different from that reported by Halpern (1993). Among these factors, the Adult Performance and Interpersonal Relationship factors were high correlated with the factor of Psychological Well-being respectively. These suggest that youth with severe disabilities who are more involved in adult performance and interpersonal relationship are those who have involved in recreation leisure activities and more satisfaction with their current status. The findings also suggest that the subjective dimensions of quality of life are related to the objective dimensions. Similarly, this specific finding also differs from that reported by Halpern (1993).

Conclusion

When the current results are combined with prior factor-analytic results, a possible conclusion is that there may be up to four different multivariate dimensions that can be measured in quality-of-life research: adult performances, productivity, interpersonal relationship, and psychological well-being. These four factors should continue to be considered valid factors (i.e. factors with empirical support) until future research indicates otherwise. The concept of quality of life is evolving; therefore, the narrow scope of indicators of quality of life used to extract the factors in past studies could be a serious drawback to the validity of these dimensions. In the future, it would be valuable to develop better indicators by using multivariate and multidimensional measurement to describe the many and varied aspects of quality of life. This study focused only on youth with severe disabilities after leaving school. It would be also beneficial to replicate this study to include individuals with different severity of

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disabilities (e.g., mild, moderate), or to include individuals without disabilities to cross-validate the four dimensional quality-of-life construct.

Based on the findings presented in this investigation, it is found that the multidimensional and multivariate approach to quality of life research tends to have a greater promise of capturing the complex nature of quality of life. There is evidence to suggest that well-being or quality of life may be domain-specific--that is, psychological well-being (i.e., Satisfaction) may be quite different from occupational/economic well-being (i.e., Productivity), or adult/Independence well-being (i.e., Adult Performance). Therefore, the future development of quality-of-life measures should also reflect this concern and establish multiple indices to examine the quality of life of individuals with disabilities. In a sense, the measurement of quality of life should be theme-oriented. The present study also indicates that the personal control/choice is the most valid indicator of the Adult Performance/Independence dimension, which is the best predictor of the quality-of-life construct. It implies that special education programs should put an emphasis on the self-determination concept that is closely related to the personal control/choice of individuals with disabilities. School practices should take into account of the self-determination and self-advocacy for individuals with disabilities.

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